3.3.4.11 Moist Cliff

3.3.4.11.1 Community Overview

This community (often found on "micro-sites" of very restricted spatial extent) occurs on shaded (by trees or the cliff itself because of aspect), moist to seeping mossy, vertical exposures of various rock types. The most common rock types are sandstone and dolomite. A greater proportion of sandstone cliff sites tend to be moist, compared to limestone cliff sites, due to the potential for capillary action in sandstone to transport water essential for plant survival. Igneous (granite, basalt) and metamorphic (quartzite) rocks tend to be dry due to their impermeability, but in some situations water moving through the ground above the bedrock cannot go through the rock and moves laterally until it finds a path to take it downward. There it will exit, often over the face of a cliff.

Common vascular plant species include columbine, the fragile ferns (*Cystopteris bulbifera and C. fragilis*), wood ferns, rattlesnake-root, and wild sarsaparilla. The rare flora of these cliffs vary markedly in different parts of the state; Driftless Area cliffs might have northern monkshood, those on Lake Superior, butterwort, or those in Door County, green spleenwort. Lichens, mosses, and ferns are important components of cliff habitats. Present knowledge of the distribution and status of many of these plant species is limited. The same is true for many invertebrate species.

3.3.4.11.2 Vertebrate Species of Greatest Conservation Need Associated with Moist Cliff

There were not any vertebrate Species of Greatest Conservation Need that were identified as moderately or significantly associated with moist cliff.

3.3.4.11.3 Threats and Priority Conservation Actions for Moist Cliff

3.3.4.11.3.1 Statewide Overview of Threats and Priority Conservation Actions for Moist Cliff

The following list of threats and priority conservation actions were identified for moist cliff in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.4.11.3.2 unless otherwise indicated.

Threats and Issues

- Loss of shading vegetative cover, by logging or other means, can result in desiccation of the cliff face.
- Quarrying destroys the bare rock communities by removing the substrate, although this might also expose and open new rock faces to colonization by plants.
- Unsustainable grazing can disrupt vegetation above cliffs, at the base of cliffs, or along broad ledges.
- Residential construction, road building and quarrying may affect hydrology and water transport to or through the bedrock and contribute to desiccation.
- Physical damage to the surface above the cliffs occurs due to livestock, vehicles, and heavy foot travel.
- Recreational activities such as rock climbing can directly damage the fragile plant growth clinging to the cliff face.
- The impacts of invasive species are unknown, but warrant investigation in regard to impacts on rare plant and invertebrate species.

Priority Conservation Actions

- A broader and more systematic approach to surveying, describing, and evaluating cliff habitats is needed.
- Setting conservation priorities is difficult unless something of exceptional value is already known to occur at a given site. This has been done in a few areas (e.g., on the Apostle Islands, in the Upper Kickapoo River Valley, in parts of the Penokee Range, and on some stretches of the Niagara Escarpment) but knowledge gaps remain significant.
- Limit or avoid grazing, quarrying, and other disruptive activities on high-value sites.
- Evaluate and seek to limit activities that could cause hydrologic disruption.
- Landowner education can succeed in helping to guide extractive and potentially high-impact recreational or grazing activities to less sensitive areas on private property.
- Some cliff-associated snail species are globally rare. The best sites for them, with the exception of state parks, appear to be privately owned. Protection should be encouraged on both public and privately owned sites.
- Surveys should be continued to search for additional sites, especially in counties where bedrock outcrops are either composed of rock that transmits water, or shaded by heavy vegetation, or exposed to the north.
- Public and private conservation organizations should work with private landowners to encourage protection of ecologically valuable sites, and support additional surveys to better assess cliff habitats.

3.3.4.11.3.2 Additional Considerations for Moist Cliff by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of moist cliff exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for moist cliff found in Section 3.3.4.11.3.1.

Additional Considerations for Moist Cliff in Ecological Landscapes with ***Major*** Opportunities for Protection, Restoration, and/or Management

North Central Forest

Cliffs are not major features of this Ecological Landscape, but some exceptional examples occur in the Penokee Range of Iron and Ashland counties, e.g., along the Marengo and Brunsweiler Rivers. Other important moist cliff exposures occur along the Brule River within the Chequamegon-Nicolet National Forests (Florence County). Additional examples occur in the Flambeau Pines/Turtle River Hemlocks (Vilas County).

Superior Coastal Plain

Sandstone cliffs on Lake Superior islands (Ashland County) are protected to a high degree within Apostle Islands National Lakeshore. Otter Island, Devils Island, and Stockton Island all contain ecologically important series of moist cliff habitat. The mainland unit of the National Lakeshore (Bayfield County) also contains excellent, protected exposures of moist cliff.

Western Coulee and Ridges

Development of bluff lands in this Ecological Landscape has been increasing, spurred by an increase in the region's popularity for second homes and by exurban development from the LaCrosse and Madison metropolitan areas. Lodde's Mill Bluff and Parfrey's Glen State Natural Areas (Sauk County), Wyalusing

State Park (Grant County), and Wildcat Mountain State Park (Vernon County) contain excellent examples of this community. Many other occurrences exist on public and private lands in this Ecological Landscape.

Additional Considerations for Moist Cliff in Ecological Landscapes with ***Important*** Opportunities for Protection, Restoration, and/or Management

Central Lake Michigan Coastal

Land use plans covering this area as of 2001 largely excluded the Niagara Escarpment as a unique natural feature. Overlapping and sometimes conflicting plans among jurisdictions can create a barrier to effective cooperation on conservation issues. Neshoto Caves and Dells (Manitowoc County), along with Escarpment Woods (Brown County), are just two of the moist cliff sites in this Ecological Landscape. An ongoing project to inventory the Niagara Escarpment may reveal additional sites worthy of protection.

Central Sand Hills

Increased scattered residential development is becoming a factor here, but is not likely to affect this community. Pine Hollow State Natural Area (Sauk County) and Petra's Ravine feature shaded moist cliffs supporting plants such as sword moss and Sullivan's coolwort.

Central Sand Plains

Upper Dells Cliffs (Columbia County) supports one of only a few globally known populations of cliff cudweed. Blackhawk Island and Castle Rock (Juneau County) are two other well-known and protected examples of moist cliff in this Ecological Landscape

Forest Transition

Dalles of the St. Croix River State Natural Area (Polk County) primarily features dry cliff along an exposed basalt formation, but there is also some moist cliff in this protected area. Dells of the Eau Claire River (Marathon County) is a county-owned State Natural Area where spray from water tumbling through a rhyolitic schist gorge sustains a moist cliff community.

Northern Lake Michigan Coastal

Red Banks Glades (Brown County) contains some of this type, and is in need of prompt conservation attention due to a combination of threats. Washington Island, Plum Island and Rock Island (all Door County) contain examples of this type that enjoy varying degrees of protection.

Northeast Sands

Club Moss Woods (Marinette County) is one site in this Ecological Landscape that may be worthy of conservation action.

Southeast Glacial Plains

Mitchell's Glen (Fond du Lac County) is a moist cliff site that received a high score for ecological significance at a workshop held to identify conservation priorities in the Upper Fox Basin.

Southwest Savanna

Most of the known sites are in private ownership.

Western Prairie

Kinnickinnic River Gorge and Delta (Pierce County) features a high, dripping sandstone shelf with a population of bulblet ferns, among many other characteristic cliff plants. The steep, high, narrow sandstone formation of the Apple River Canyon State Natural Area (St. Croix County) supports another protected example of this community.